Pushing the Envelope			
2008 Science			
State Frameworks			
Mississippi Science			
Grade 5			
Activity/Lesson	**State**	**Standards**	
Types of Engines (pgs. 11-23)	MS	SCI.5.2.c.3	Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world. Investigate the motion of an object in terms of its position, direction of motion, and speed and recognize variables that affect speed (e.g., ramp height/length/surface, mass of object)
Types of Engines (pgs. 11-23)	MS	SCI.5.2.c.4	Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world. Effects of an unbalanced force on an object's motion in terms of speed and direction
Chemistry (pgs. 25-41)	MS	SCI.5.2.a	Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world. Determine how the properties of an object affect how it acts and interacts.
Physics and Math (pgs. 43-63)	MS	SCI.5.2.c.2	Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world. Investigate the motion of an object in terms of its position, direction of motion, and speed: Force required to move an object using appropriate devices (e.g., spring scale)
Physics and Math (pgs. 43-63)	MS	SCI.5.2.c.4	Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world. Investigate the motion of an object in terms of its position, direction of motion, and speed: Effects of an unbalanced force on an object's motion in terms of speed and direction
Rocket Activity (pgs. 69-75)	MS	SCI.5.2.c.2	Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world. Investigate the motion of an object in terms of its position, direction of motion, and speed: Force required to move an object using appropriate devices (e.g., spring scale)

Rocket Activity (pgs. 69-75)	MS	SCI.5.2.c.4	Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world. Investigate the motion of an object in terms of its position, direction of motion, and speed: Effects of an unbalanced force on an object's motion in terms of speed and direction
Pushing the Envelope			
2008 Science			
State Frameworks			
Mississippi Science			
Grade 6			
Activity/Lesson	**State**	**Standards**	
Physics and Math (pgs. 43-63)	MS	SCI.6.2.c.1	Analyze chemical and physical changes and interactions involving energy and forces that affect motion of objects. Investigate and describe the effects of forces acting on objects: Gravity, friction, magnetism, drag, lift, and thrust
Physics and Math (pgs. 43-63)	MS	SCI.6.2.c.2	Analyze chemical and physical changes and interactions involving energy and forces that affect motion of objects. Investigate and describe the effects of forces acting on objects: Forces affecting the motion of objects
Rocket Activity (pgs. 69-75)	MS	SCI.6.2.c.1	Analyze chemical and physical changes and interactions involving energy and forces that affect motion of objects. Investigate and describe the effects of forces acting on objects: Gravity, friction, magnetism, drag, lift, and thrust
Rocket Activity (pgs. 69-75)	MS	SCI.6.2.c.2	Analyze chemical and physical changes and interactions involving energy and forces that affect motion of objects. Investigate and describe the effects of forces acting on objects: Forces affecting the motion of objects
Pushing the Envelope			
2008 Science			
State Frameworks			
Mississippi Science			
Grade 7			
Activity/Lesson	**State**	**Standards**	
Physics and Math (pgs. 43-63)	MS	SCI.7.2.f.1	Develop an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects. Describe the effects of unbalanced forces on the speed or direction of an object's motion: Variables that describe position, distance, displacement, speed, and change in speed of an object

Physics and Math (pgs. 43-63)	MS	SCI.7.2.f.2	Develop an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects. Describe the effects of unbalanced forces on the speed or direction of an object's motion: Gravity, friction, drag, lift, electric forces, and magnetic forces
Rocket Activity (pgs. 69-75)	MS	SCI.7.2.f.1	Develop an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects. Describe the effects of unbalanced forces on the speed or direction of an object's motion: Variables that describe position, distance, displacement, speed, and change in speed of an object
Rocket Activity (pgs. 69-75)	MS	SCI.7.2.f.2	Develop an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects. Describe the effects of unbalanced forces on the speed or direction of an object's motion: Gravity, friction, drag, lift, electric forces, and magnetic forces
Pushing the Envelope			
2008 Science			
State Frameworks			
Mississippi Science			
Grade 8			
Activity/Lesson	**State**	**Standards**	
Types of Engines (pgs. 11-23)	MS	SCI.8.2.c	Apply concepts relating to an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects. Distinguish the motion of an object by its position, direction of motion, speed, and acceleration and represent resulting data in graphic form in order to make a prediction.
Chemistry (pgs. 25-41)	MS	SCI.8.1.c.2	Draw conclusions from scientific investigations including controlled experiments. Summarize data to show the cause and effect relationship between qualitative and quantitative observations (using standard, metric, and non-standard units of measurement). Understand types of data (e.g., linear measures, mass, volume, temperature, area, perimeter)

Chemistry (pgs. 25-41)	MS	SCI.8.2.a.1	Apply concepts relating to an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects. Identify patterns found in chemical symbols, formulas, reactions, and equations that apply to the law of conservation of mass: Chemical symbols and chemical formulas of common substances such as NaCl (table salt), H20 (water), C6H12O6 (sugar), O2 (oxygen gas), CO2 (carbon dioxide), and N2 (nitrogen gas)
Chemistry (pgs. 25-41)	MS	SCI.8.2.a.2	Apply concepts relating to an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects. Identify patterns found in chemical symbols, formulas, reactions, and equations that apply to the law of conservation of mass: Mass of reactants before a change and products after a change
Physics and Math (pgs. 43-63)	MS	SCI.8.2.f	Apply concepts relating to an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects. Recognize Newton's Three Laws of Motion and identify situations that illustrate each law (e.g., inertia, acceleration, action, reaction forces).
Rocket Activity (pgs. 69-75)	MS	SCI.8.2.f	Apply concepts relating to an understanding of chemical and physical changes, interactions involving energy, and forces that affect motion of objects. Recognize Newton's Three Laws of Motion and identify situations that illustrate each law (e.g., inertia, acceleration, action, reaction forces).
Pushing the Envelope			
2008 Science			
State Frameworks			
Mississippi Science			
Grades 9-12 (Physical Science)			
Activity/Lesson	**State**	**Standards**	
Types of Engines (pgs. 11-23)	MS	SCI.9-12.5.c	Investigate and apply principles of physical and chemical changes in matter. Write chemical formulas for compounds comprising monatomic and polyatomic ions. Classify types of chemical reactions (e. g., composition, decomposition, single displacement, double displacement, combustion, acid/base reactions).
Chemistry (pgs. 25-41)	MS	SCI.9-12.5.b	Investigate and apply principles of physical and chemical changes in matter. Write chemical formulas for compounds comprising monatomic and polyatomic ions. Balance chemical equations.

Physics and Math (pgs. 43-63)	MS	SCI.9-12.2.a.2	Describe and explain how forces affect motion. Demonstrate and explain the basic principles of Newton's three laws of motion including calculations of acceleration, force, and momentum: Net force (accounting for gravity, friction, and air resistance) and the resulting motion of objects
Physics and Math (pgs. 43-63)	MS	SCI.9-12.2.b.1	Describe and explain how forces affect motion. Explain the connection between force, work, and energy: Force exerted over a distance (results in work done)
Physics and Math (pgs. 43-63)	MS	SCI.9-12.2.b.2	Describe and explain how forces affect motion. Explain the connection between force, work, and energy: Force-distance graph (to determine work)
Rocket Activity (pgs. 69-75)	MS	SCI.9-12.2.a.2	Describe and explain how forces affect motion. Demonstrate and explain the basic principles of Newton's three laws of motion including calculations of acceleration, force, and momentum: Net force (accounting for gravity, friction, and air resistance) and the resulting motion of objects
Rocket Activity (pgs. 69-75)	MS	SCI.9-12.2.b.1	Describe and explain how forces affect motion. Explain the connection between force, work, and energy: Force exerted over a distance (results in work done)
Rocket Activity (pgs. 69-75)	MS	SCI.9-12.2.b.2	Describe and explain how forces affect motion. Explain the connection between force, work, and energy: Force-distance graph (to determine work)
Pushing the Envelope			
2008 Science			
State Frameworks			
Mississippi Science			
Grades 9-12 (Physics)			
Activity/Lesson	**State**	**Standards**	
Physics and Math (pgs. 43-63)	MS	SCI.9-12.2.a.3	Develop an understanding of concepts related to forces and motion. Use inquiry to investigate and develop an understanding of the kinematics and dynamics of physical bodies: Vector techniques and free-body diagrams to determine the net force on a body when several forces are acting on it
Physics and Math (pgs. 43-63)	MS	SCI.9-12.2.c	Develop an understanding of concepts related to forces and motion. Analyze real-world applications to draw conclusions about Newton’s three laws of motion.

Rocket Activity (pgs. 69-75)	MS	SCI.9-12.2.a.3	Develop an understanding of concepts related to forces and motion. Use inquiry to investigate and develop an understanding of the kinematics and dynamics of physical bodies: Vector techniques and free-body diagrams to determine the net force on a body when several forces are acting on it
Rocket Activity (pgs. 69-75)	MS	SCI.9-12.2.c	Develop an understanding of concepts related to forces and motion. Analyze real-world applications to draw conclusions about Newton's three laws of motion.